City Of Hollywood Park

Wildlife Division

First Annual Management Plan

October 2013-October 2014

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GENERAL WILDLIFE OVERVIEW

The White-tailed Deer, scientific name *Odocoileus virginianus,* belong to the Cervid family. Within this family are most commonly the major game animals associated with North America. The particular characteristic that sets them apart from other Ungulates (split hooved animals) and Ruminantes (animals with four chambered stomachs) is that they shed their antlers annually. Unlike goats, sheep, cattle, and others that have horns, which are a production of karatin surrounding a bone (similar to a finger nail), antlers are formed new, entirely by bone growth every year. This new bone is formed by a vascular matrix called velvet which supplies the growing bone with the blood and nutrients necessary for growth.

Deer physiology and movement patterns are heavily regulated by moon phase, barometric pressure and photo periods (length of day). Photoreceptors in the eyes of cervids calculate day length to determine when the antlers are grown, harden, and shed. They also determine such things as estrus production in females, testosterone production in males. Moon phase, duration, rise and set, along with barometric pressure greatly influences deer feeding times, rut activity, bedding length, and social interaction.

Like all ruminants, deer have a four (4) chambered stomach that aids in the break down of herbatious materials. Generally the diet of a deer consists of 50% forbs, 40% browse, 10% grasses. This diet changes by seasonal availability in that forbs and browes switch ratios. It is interesting to note that grasses are rarely found above 15%. Plant materials that contain silica and hard cellulose must go through a specialized process to extract all the nutrients from the plant. The average whitetail deer needs to consume 3-5 lbs of food each day to maintain a healthy sustainable life. Deer will usually spend 6-10 hours per day eating at 4-6 feedings per day. During down times, the plants that were consumed during feeding are then regurgitated and further broken down by chewing and salivation.

Female deer have a gestation of approximately seven months. Because the declining photoperiod in the fall triggers estrus and testosterone production, the rut usually begins around early November. At that time the first females will come into estrus. Typically a female will cycle up to 4 times if not bred during her first ovulation. Typically does will begin to fawn in May to June. Younger females that come of age during the breeding season will likely be bred late and fawn as late as August. Mature does typically carry twins while younger does will carry only one fawn. Deer survivability increases exponentially after birth. By 6 months of age mortality rates in deer decrease to less than 15%. With an 85% survivability rate, and a 75% twin birthing rate, deer populations will grow exponentially.

For literally hundreds of thousands of years white-tailed deer have shared their habitats with a diverse array of predators, including humans. Hunting and predation were the main contributing factors that influenced the population dynamics of the native deer populations. The current over abundance of deer throughout much of North America, and their consequent impacts on ecosystems and urban interfaces are the result of human caused extirpation and or extinction of predators and movements from certain groups to ban hunting (Natural Resources Inc 2007). There is broad agreement within the scientific community that native habitat and urban landscapes throughout the United States are in a seriously degraded ecological condition as a result of high deer densities (Latham et al. 2005). It is widely recognized that deer are a keystone species in wildlife communities (Waller and Alverson 1997) because they can directly affect habitat conditions (Anderson and Katz 1993, Augustine and deCalesta 2003, Horsely et al. 2003) and thus, indirectly affect other wildlife species (deCalesta 1994). An independent evaluation by a team of scientists on behalf of the Forest Certification Council found that deer had decimated the diversity and sustainability of flora and fauna on Pennsylvania's system of State Forest lands (Wager et al. 2004). Over time, high deer densities alter habitats, reduce or eliminate native wildflowers and shrub species, and dramatically decrease the variety of tree species (Latham et al. 2005). Deer may also depress reproductive success of native plants while simultaneously facilitating the spread of exotic invasive species (Williams and Ward 2006).

Over population occurs when the number of animals living on the land exceeds the carrying capacity of the land. Conventional wisdom assesses that in healthy deer populations, managers need to remove approximately 30% of the female deer to stabilize the herd and 40% to effect a population reduction. It is clear that urban/wildlife interface management is the most difficult of all management. Harden et al. (2005) concluded that as human development increases, deer management relying on traditional methods becomes increasingly difficult. To effectively serve communities, managers, now and in the future, will be required to identify likely areas of conflict in which nontraditional deer management options will prove more effective.

White-tailed deer adapt to habitat changes caused by human development (Conover 1995). They habituate to human presence (Hansen et al. 1997) and do well in and around suburban neighborhoods because there is little effective hunting, abundant food and cover, and few remaining predators. (DeStefano and DeGraaf 2003). Fragmentation of land ownership into smaller parcels and a lack of cooperation between the various levels of government that must work together in suburban areas can also pose challenges to effective deer management through traditional means (Messmer et al. 1997b, Lauber and Knuth 2000). Some residents may oppose any lethal management options (Messmer et al. 1997a, Stout et al. 1997, Lauber and Knuth 2000). ***Consequently***, deer populations far surpass the carrying capacity of the land. This consequence also has major ramifications to humans such as:

1. Deer-vehicle collisions

An estimated 1.5 million deer-vehicle collisions (DVCs) occur each year.in the U.S. The average cost of vehicle repairs was $1,500 which means that total vehicle damage resulting from a collision with a deer exceeded $1 billion annually (Conover et al. 1995). Based on their known market share, State Farm Insurance projected more than 115,000 deer-vehicle claims for all insurance companies in the state during July 1, 2011 – June 30, 2012. It is also estimated that 29,000 people are injured and more than 200 fatalities occur annually in the U.S. as a result of a DVC (Conover et al. 1995).

2) Landscape/garden damage

Deer browsing on ornamental trees, shrubbery, and gardens in suburban and residential areas is a common complaint and financially impacts homeowners each year (Connelly et al. 1987, Witham and Jones 1987, Conover 1997b). Wildlife damages incurred by metropolitan residents in the U.S. have been estimated at $3.8 billion annually. This is in addition to spending $1.9 billion and 268 million hours trying to solve or prevent the problem (Conover 1997b). Deer are not responsible for all of this damage. Only 4% of respondents to a 1997 survey reported a problem with deer. Using this percentage, a conservative estimate of deer damage and preventive measure costs to households is $376 million (Conover 1997a).

3. Public Safety

Encounters with aggressive deer are not uncommon in urban and suburban areas where deer and people interact frequently. These encounters are almost always associated with the fawning and breeding season. Does are highly defensive of their young and have been know to attack unsuspecting dogs and people who get too close to their fawns. In the fall, bucks in breeding condition with hard antlers and high levels of testosterone can cause significant harm, even death. Feeding deer exacerbates this type of problem by bringing deer and people closer and habituating deer.

4. Lyme Disease

Lyme disease was first recognized in the U.S. in 1975. Lyme disease is caused by the spirochete *Borrelia burgdorferi* and is spread through the bite of an infected tick (*Ixodes scapularis)*. Lyme disease, as well as other tick-borne diseases, poses a significant threat to humans. Deer are dead-end hosts for Lyme disease and play no role in the transmission cycle (Underwood 2005, Perkins et al. 2006). However, deer play a part in the complex life cycle of *I. scapularis,* by supplying adult ticks with a final blood meal and a place to mate (Underwood 2005, Perkins et al. 2006).

It is important to note that when human directed deer mortality is used to mimic the population-stabilizing effects of natural predators on deer, there is a simultaneous positive ecological benefit. Such population reduction measures contribute to the protection and restoration of the structure, diversity and function of the ecosystem and the intrinsic population of the deer that remain. Not only does this increase the over all quality of the habitat and deer herd it also decreases the negative effects previously stated.

AESTHETICS, HISTORY, AND ECONOMICS

Aesthetics: All the wildlife (deer in particular) bring great value to the city of Hollywood Park through aesthetics. They are pleasurable to observe and bring a sense of serenity to the town. Because the deer are viewed as pets and bring great joy to the citizens it is paramount that the city and its citizens manage the population to maintain a healthy, balanced, sustainable ecosystem.

History: The deer that reside in HWP have been a central focal point throughout time. They are both a cause for interest and suspect of problems. The rapid expansion encountered by the towns sister city, San Antonio, has in essence created a habitat island. Within this island are the native deer that once were free to navigate. However with the island effect, the remaining deer have been trapped. With diminishing natural predators for the past decade, the deer herd of Hollywood Park has exponentially grown surpassing the carrying capacity of the available habitat.

Economics: Because of the intrinsic value of the aesthetics, the deer of HP increase property values, which in-turn generates revenue for the city. However, because deer populations are overcrowded, this also brings a negative impact to the citizens through MV collisions, landscape devastation, disease and parasites, and increased animal/human encounters through aggression. In some urban areas with an overpopulation of deer, municipalities have turned to paid hunting outings as a means to both generate revenue and provide a population control mechanism.

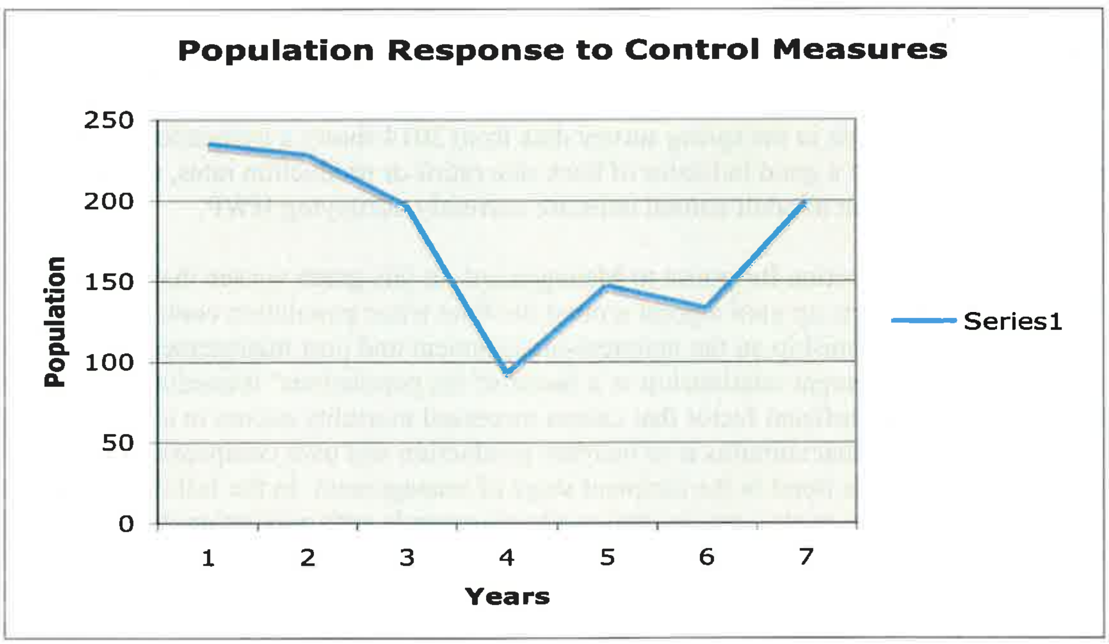
POPULATION TREND DATA

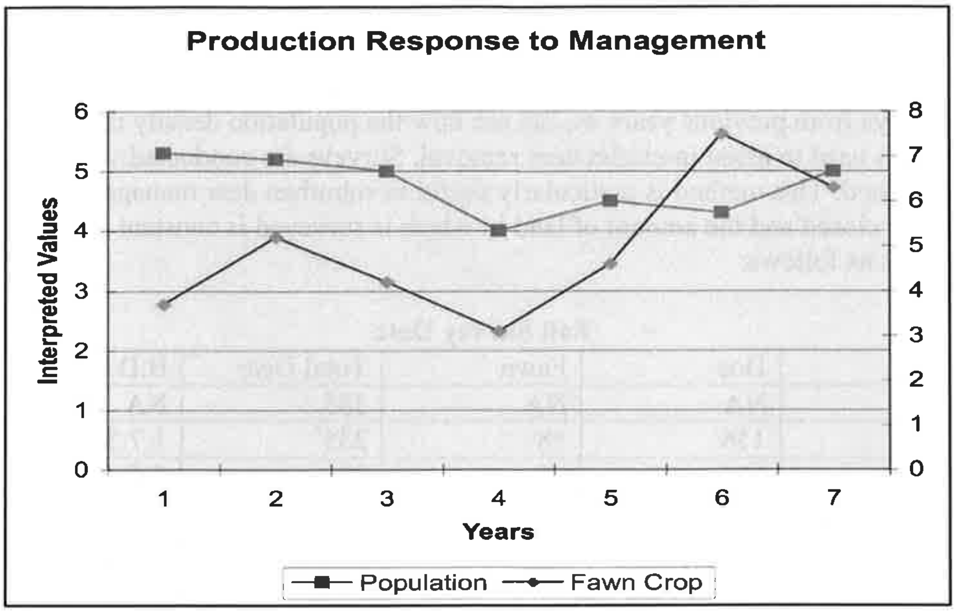
We use trend data analyze long-term effects and assess the success of management strategies. If we look at the population surveys from previous years we can see how the population density is trending based on methods and techniques used to assist in excess deer removal. Surveys are conducted via the modified transect incidental sighting method. This method is particularly useful in suburban deer management because the population is primarily closed and the amount of land in which is surveyed is constant and known. The population trend data is as follows:

Fall Survey Data

Year	Bucks	Doe	Fawn	Total Deer	B:D Ratio	D:F Ratio
2004	NA	NA	NA	365	NA	NA
2005	21	156	58	235	1:7.5	40%
2006	23	134	71	228	1:6	55%
2007	16	127	54	197	1:8	45%
2010	17	58	18	93	1:3.5	30%
2011	28	81	38	147	1:3	45%
2012	26	61	46	133	1:2.5	75%
2013	29	104	66	199	1:3	63%
2014*				128		

*= spring survey data, all other data from fall surveys





Trend Data Analysis:

Looking at the trend data we can clearly see that management efforts had a significant impact on population. In 2005 we can see that management efforts were initiated and we can see the population begin to trend downward. By following and adhering to the management program for consecutive years, removal efforts gained traction and the population responded accordingly. In 2011 we see a significant up-tick in deer population, rebounding almost 30% in one year. This time also coincides with the lack of population maintenance and control efforts. This illustrates how imperative it is to remain vigilant in maintaining a population control program. Even in the spring survey data from 2014 shows a tremendous population issue. Although spring surveys are not a good indicator of buck:doe ratios or production rates, they do provide valuable insight as to the amount of adult animal units are currently occupying HWP.

Lets now look the Production Response to Management. In this graph we see that fawn production mirrors population control efforts up until a point around the time when population control measures cease. There is a slightly inverse relationship on the incipient-management and post management sides of the graph. We can explain the pre-management relationship as a factor of the populations' immediate response to a new variable. In general, when a significant factor that causes increased mortality occurs in a population, mother natures immediate response to that stimulus is to increase production and over compensate for higher than normal mortality. We notice this trend in the incipient stage of management. In the following years subsequent to the initial phase of population control we see that production trends with population decline. This can be explained as the response to habitat degradation from overpopulation. As the habitat declined, the production value also declined even though population numbers trended down. This paradox is due to the natural habitat response to over grazing. Habitats will normally compensate for heavy browsing pressure over several years in a cyclical pattern such as we see here. After which time those plants will fall out and either die or reduce biomass production. In the same way it takes a habitat more time to decompensate, likewise it takes more time to rebound. This is where we see on the post-management side a sharp increase in production. Since habitat response is delayed, so are production rates. In the post management side of the graph we can see where this phenomena occurs. The sharp incline in production rates indicates that the habitat had finally made a comeback response from the population control efforts even though at that time control measures were already abandoned.

HABITAT ANALYSIS AND CARRYING CAPACITY

Along with human ecology, wildlife managers need to consider several multifaceted approaches to examining urban/suburban ecology (VanDruff et al. 1994) including the patch-dynamic approach. This perspective recognizes that the urban/wildlife interface is a mosaic of biological and physical patches of habitat within a matrix of infrastructure (Nilon and Pais 1997, Zipper et al. 2000). It is clearly evident that Hollywood Park presents such a habitat.

It is important to note one of the more significant advances in deer management in the past two decades. This management approach is the recognition that deer populations can be managed on a small spatial scale (Porter et al. 1991, McNulty et al 1997, Oyer and Porter 2004). This approach to deer management utilizes the strong home range fidelity behavior of adult female deer (Van Deelen et al. 1998, Nelson and Mech 1999), the instinctive tendency of juvenile females to establish home ranges adjacent to their natal home range, social organizational patterns of female deer into genetically-related groups (Tierson et al. 1985, Nelson and Mech 1999) and the important role females play in deer population dynamics (Porter et al. 2004). Low female dispersal (0-20%) and strong home range fidelity (Aycrigg and Porter 1997, Lesage et al. 2000) allow for localized deer herd management to be effective at a small spatial scale, since social units of genetically-related female deer tend to remain in their respective home ranges. Studies have shown that creating local densities that are lower in comparison to those on the surrounding landscape is possible (Behrend et al. 1970, McNulty et al. 1997, Kilpatrick et al. 2001). However, because HWP and HCV are a contiguous island habitat, the spatial relations of the deer that reside here will tend to overlap. Dispersal variances will be greatly exacerbated in this microhabitat due to reduced habitat availability and the competition for resources. In turn this will decrease the amount of time management efforts will have a lasting impact. While deer removal may be evident immediately, it will only take a short time before other deer from HCV fill their void.

Hollywood Park encompasses about 1.5 square miles, which equates to roughly 960 acres. However out of that 960 acres only approximately 75% can be considered usable habitat after we factor in houses, permanent structures and infrastructure. Thereby reducing usable habitat to an estimated 720 acres.

When we look at a well-balanced plant community we would see three distinct levels of succession. The first stage is grasses and forbs, the second would be woody browse with grasses and forbs, and lastly would be a fully mature habitat with the first two stages along with mature trees. Within this habitat we can further distinguish between good, fair, and poor depending on plant diversity and biomass production. Each of these categories allows us to determine habitat production in relationship with the needs of the wildlife in that area. Pristine habitat for whitetail deer is typically an early stage three habitat with a wide variety of plant diversity lightly mottled with trees. In this habitat we would see at least >3 different tree species, >8 different shrub species, and >6 different grass species, and >12 forbs species. As we see in Hollywood park, because of housing development, ornamental landscaping and turf grass installation, habitat values decrease dramatically. Diversity within the habitat is also greatly diminished, thereby decreasing biomass production, which ultimately affects the density of animal units that can be sustained over a one-year period. In HWP the habitat diversity values in respect to <u>edible</u> forage for deer are approximately as follows: 2 tree species, 5 shrub species, 2 grass species, and 7-9 forbs species.

Taking all of this into consideration, the normal average density for deer on a pristine habitat in this area, based on years of documented data and observation, is typically somewhere in the neighborhood of 1 deer to 10 acres. However, because Hollywood park is not considered pristine habitat we have to consider the aforementioned variables. With such a low diversity in plant community and stifling biomass production the optimal density is more likely assessed at 1:16 acres. Looking at an optimal habitat with ratios of 1:10 we can assume that with 720 acres we can safely carry 72 deer for their entire life through good years and bad.

However, when we look at the carrying capacity of Hollywood Park with the revised assessment of the habitat we can only assume that with 720 acres of usable habitat and a 1:16 ratio, we can sustain around 45 adult deer.

This problem is exponentially compounded when we realize that the trend data is also showing that the majority of deer are observed from Meadowbrook/Donnella and south, thereby decreasing the amount of utilized land and increasing density proportionately. *See Appendix for site map of deer accumulation based on field observations and previous HWP surveys.*

Looking at the trend data from population surveys we can clearly see that population numbers are well over the sustainable ratio for carrying capacity. If we take the last seven years of data, the average amount of animals observed was 176 deer. Furthermore when we break the data down we realize that not only is there a population density problem but we also have a sex ratio problem. The average sex ratio for the past 7 years is 1:4.5 buck/doe. If we think about this on the most basic of terms, more does equals more babies, which equals more deer. The more deer there are, the more of a problem exists. What is even more interesting is that the fawn crop for the past seven years is in despair at 48% or 2:1 Doe/fawn. In normal wild populations fawn crops generally range from 80-110%. Over population contributes significantly and directly to a decrease fawn crop through low milk production during lactation, abortion of embryos, fetal cannibalism, abandonment of newborn fawns, and lack of adequate native ground cover. Further more, poor milk production and low habitat values are the leading cause of detrimental antler growth in male deer. The first two years of a male deer's life are critical for future expression of genetic potential. Without proper nutrition, genetic potential can never be realized. To further exacerbate this issue, in a comprehensive management plan it is highly likely that a certain portion of male deer will be removed from the population that would have otherwise remained.

Lastly, it is often easy to misinterpret or judge deer health. With respect to supplemental feeding in suburban areas, homeowners often feed deer for aesthetic aspects and because they presume they are helping the deer. This is a false sense of help however. Although this feeding may assist in providing the deer some nutrients, it actually exacerbates the underlying problem of habitat destruction and overall her health degradation. Deer that reside in suburban areas often present with an acceptable appearance of health. However, this pseudo presentation can be very misleading. A good steward of wildlife needs to look at multiple aspects of the ecosystem and population dynamics to determine the overall health of a population, not just the appearance of the animals within. Wild animals will often compensate in physiology for long periods of time before the appearance of malnutrition can be seen to a laypersons eye. When deer managers institute a feeding program it is strictly for supplementation only and is generally very costly. Population dynamics should never be calculated on the basis, or with consideration of supplemental feed. Subsequently, feeding regimes in suburban areas are inadequate with regards to feed quality, quantity, timing, and continuity.

POPULATION CONTROL METHODS AND OPTIONS

As deer populations repopulated landscapes where hunting has not typically occurred, and as residential communities have developed in more rural areas, more diverse deer management values, goals and perspectives have come into play. The challenge for suburban communities grappling with deer management is to find methods that are acceptable to a broad range of public stakeholders, effective at decreasing deer numbers, and applicable at reasonable cost (Decker and Gavin 1987, Stout et al. 1993, Conover 1995, Swihart et al. 1995).

It is useful to know that studies of other communities have found that residents' attitudes toward management techniques are not necessarily fixed, and that communication can influence attitudes (Lauber and Knuth 2004). Suburban residents may have different concerns about management techniques than wildlife managers. Determining what those concerns are and distributing accurate, unbiased information about those concerns is most likely to influence public perceptions of deer management techniques (Lauber and Knuth 2004).

When addressing suburban deer problems, the advantages and disadvantages of all available deer management techniques must be evaluated. Differing circumstances among suburban communities will result in varied approaches to solving the problem. Furthermore, it is likely that a combination of management techniques will be necessary to achieve desired results (DeNicola et al. 2000). Involved stakeholders should be made aware that suburban deer management objectives are achievable, but they are often difficult and costly. Deer control measures require considerable long-term planning and commitment. The costs of suburban deer management should always be compared to potential benefits such as reduced deer/vehicle accidents, improved human safety, and decreased landscape/garden damage (Doerr et al. 2001).

It is important for communities to develop measurable long-term goals and objectives as part of a comprehensive deer management plan before implementing deer control measures. Objectives based on deer abundance could be evaluated with standard deer survey techniques such as survey transects or time/area counts. Indicators such as frequency of deer/vehicle collisions, number of reported deer complaints, or predetermined reductions in landscape damage, could be used to measure cultural objectives. Stakeholders should understand that the total elimination of the problem (or the deer herd) is neither practical nor achievable in most cases. Rather, the goal should be related to the reduction of deer-human conflicts to an acceptable level (DeNicola et al. 2000).

Managing an overabundant deer population should be accomplished in two phases (DeNicola et al. 2000). First, the **Initial Reduction Phase** is ***implemented to remove large numbers of deer from an overabundant herd during a short period of time to achieve desired deer densities.*** Deer managers have learned that deer herd reduction measures that ***remove less than 50%*** of the estimated population typically ***do not provide significant relief*** from density-related problems. After completion of the initial phase, a **Maintenance Phase** includes *long-term efforts* to maintain deer densities at target levels. Many protected areas include deer-proof fencing projects in their long-term maintenance program in order to restrict the ingress of additional deer and gain more control over their deer herd. Most importantly, deer managers should have long-term deer management plans in place before initiating deer herd reduction operations.

Deer management costs can be highly variable depending on available labor, deer densities, management objectives, and other site-specific factors. As deer numbers decrease, it takes increased effort and resources to affect the remaining population. DeNicola et al. (2000) states, "High costs associated with *diminishing returns may prevent achieving population goals* ***with some techniques***." Of course, deer managers must comply with applicable state wildlife regulations, city ordinances, and community policies while conducting deer control measures. Lethal control measures commonly require the approval of city government and special authorization from Texas Parks and Wildlife Department.

Management Options:

1. SHARPSHOOTING, PROCESS, AND DONATE

Many suburban communities and protected areas across the United States have employed trained and experienced sharpshooters to reduce or control deer numbers. Sharpshooting has been demonstrated as the most effective technique to discreetly remove significant numbers of deer from targeted areas within a relatively short time period (Butfiloski et al. 1997, DeNicola et al. 2000). Some protected areas and parks have utilized on-staff conservation officers for sharpshooting programs. Others have hired and trained off-duty police officers or employed specialized contractors to conduct sharpshooting operations (DeNicola et al. 1997, Frost et al. 1997, Jordan et al. 1995, and Stradtmann et al. 1995). Specialized sharpshooting contractors commonly utilize night-vision equipment, suppressed rifles, and elevated stands to harvest deer at baited areas. Regardless of the chosen method, sharpshooters should be selected based on experience, training, and efficiency at harvesting deer. There is most likely a significant difference in harvest efficiency among shooters.
Sharpshooter operations may cost $100 - $200 per deer.

Possible Sharpshooting Program Options/Suggestions (adapted from DeNicola et al. 2000):

- **Use baits for attracting deer to designated areas prior to removal efforts.** Research has shown that sharpshooting over bait is more productive than opportunistic sharpshooting.
- **Shoot deer from portable tree stands, ground blinds, or from vehicles during day or night.**
- **Select head (brain) or neck (spine) shots to ensure quick and humane death.** Cranial shots are very humane and *approved by the American Veterinary Association as an acceptable means to dispatch animals.*
- **Process deer in a closed and sheltered facility.**
- **Donate meat to food banks for distribution to needy people in the community**

2. TRAP/DART AND TRANSPORT (TTT)

Trap and translocation efforts have been utilized by numerous communities and protected areas across the United States. This technique's popularity has been a result of the general public's perception that it poses no risk to human safety and is a non-lethal solution to deer overabundance problems (Stout et al. 1997). ***However, very few deer managers have accomplished population reduction goals with this method. Capture and translocation has been shown to be ineffective and costly*** (Jones and Witham 1990). Furthermore, translocated deer have demonstrated high mortality rates resulting from: capture-related injuries, capture myopathy (trapping stress), unfamiliarity with the release site, human activities, and encounters with new mortality agents (Beringer et al. 1996, Jones and Witham 1990). Translocated deer from residential areas usually demonstrate reduced flight distances when disturbed and a preference for roadsides and open lawns. Studies have shown that as many as 25% of translocated deer die within the first two months of trapping/translocation, and more than 65% of deer may not survive longer than one year (Beringer et al. 1996, Jones and Witham 1990, NH Fish and Game Dept. 1996, O'Bryan and McCullough 1985). There are several other factors, which contribute to this technique's impracticality. Trapping success is often related to habitat type. Deer are less attracted to artificial baits in areas with adequate forage. ***Deer also become increasingly wary of trapping mechanisms as projects progress. Translocation efforts are further complicated by the lack of suitable release sites. Most habitats within the species' native range are already saturated with deer, and cannot withstand supplemental stockings without risking damage to the habitats.*** Lastly, wildlife diseases are another concern when deer are moved from one location to another. This technique has the potential to spread harmful and contagious pathogens from one deer population to another. Trapping operations can range from $150 - $600 per deer.

3. TRAP, PROCESS, AND DONATE (TTP)

Deer can be captured with a variety of traps or nets. They can be driven, or herded, into the entrapments or attracted with bait. Following capture, deer are euthanized either on or off site, most commonly with a bolt-gun. Texas Parks and Wildlife Department recently approved this method to control overabundant deer herds. However, trap and euthanasia is not currently authorized by all State natural resource agencies, and has been assessed or considered in only a few locations within the United States. Additionally, it has been proposed as a complement to sharpshooting programs in areas with extremely high deer densities. This aspect of deer removal, like sharpshooting, serves a dual benefit. Not only are deer numbers controlled but the meat from the animals is processed at a professional plant and donated to various ministries for charitable work to feed the hungry.

4. FENCING

Fencing is a method most protected areas utilize for effective and long-term deer control. This method prevents the ingress of additional deer and aids with local population control measures. However, many residents may perceive fence construction as a distraction from the aesthetics of their community. Other difficulties encountered with this technique may include road, stream, and utility right's-of-way that traverse the proposed fence line. In some cases, multiple ownership of proposed fence lines may also be an obstacle to fence construction. Most effective fence designs include mesh or high-tensile wire at least 8 to 9 feet in height in order to restrict deer movements. Private contractors usually charge between $15,000 and $20,000 per mile to construct these fences. Construction costs increase if fence lines require clearing. While initial fence construction costs are high, long-term costs of this deer control method are comparable to other techniques. For example, if 100 deer are prevented from entering a one-mile section of the property during a 10-year period, the fence has saved landowners $10,000 to $25,000 in other program expenditures. In some situations, partial fences can be constructed along deer travel corridors to restrict the ingress of additional deer. Some properties begin fencing projects on these highly traveled borders and construct additional sections as funds become available.

5. FERTILITY CONTROL AGENTS

Researchers have been experimenting with fertility control agents for free-ranging deer for many years. However, past studies have indicated the use of these drugs to be impractical and cost-prohibitive (NH Fish and Game Dept. 1996, Rudolph et al. 2000). Due to extensive man-hour requirements, costs per treated female have been as much as $550 for the initial treatment and up to $175 for annual booster treatments. Regardless, residents often request this technique as a way to solve nuisance deer problems humanely, safely, and non-lethally. Researchers commonly separate deer fertility control agents into two groups (DeNicola et al. 2000, Waddell et al. 2001): (1) contraceptive agents that prevent conception and (2) abortion chemicals that terminate pregnancy. Fertility agents are typically administered remotely with a rifle. Oral contraceptives are not feasible due to the inability to select for a target animal, lack of dosage control, and difficulties with absorption of the active ingredient (NH Fish and Game Dept. 1996, Rudolph et al. 2000).

<u>Obstacles to Effective Fertility Control:</u>

1. Deer Population Must Be "Closed"

Treated deer populations must be isolated, or closed, from adjacent populations. Deer immigration from adjoining properties would negate any fertility control efforts within the treated area. New immigrants would not have been exposed to the fertility agents. Additionally, chemicals used to control white-tailed deer fertility are experimental and not FDA-approved for human consumption. A treated deer in an "open" population could leave the property, where it could be subject to human harvest and consumption.

Fertility Control Continued:

2. **Population Must Be Small**
   Because annual mortality rates for suburban deer populations are often very low, a large proportion of the females (70 to 90 percent) must be treated to curb or reduce population growth. Since oral fertility agents are not an option, the majority of females within the population must be captured, marked, and treated with the drug. With some drugs, sequential treatments must be administered to each female (Rudolph et al. 2000)
3. **Population Must Be At Target Level**
   As previously stated, mortality rates for suburban deer populations are usually low. Eliminating reproduction within the deer herd will not reduce total deer numbers for several years after initiating the antifertility program.
4. **Timing of Drug Administration**
   Abortion agents, such as Prostaglandin $F_{2\alpha}$, must be administered at a certain period of fetal development in order to effectively control reproduction. Females treated during early gestation are often not affected by the drug. If the drug is effective, females often resume their normal estrous cycles after abortion. When treated during late gestation, abortion-related animal behavior may repulse humans (abortion of late-term fetuses and fetal cannibalism; Waddell et al. 2001).

6. LOCAL OPTIONS Local options are techniques that can be utilized to prevent deer from damaging small areas (yards, gardens, etc.). These techniques include fencing, repellants, the use of dogs, etc.

Feeding

Even though many people enjoy providing food for deer and other wildlife, feeding encourages large congregations of deer to inhabit small areas. Feeding exacerbates an already problematic situation by restricting deer movements and enhancing their reproduction and survival. This practice also makes them more tame and fearless of people.

Community education efforts regarding the negative impacts of feeding may help alleviate this problem. Alternately, regulations which prohibit feeding have been passed in some areas with varying degrees of success. For example, Elkins Lake subdivision in Walker County, Texas successfully passed an anti-feeding regulation in 2004. Large deer congregations, which were previously observed traveling from one feeding area to another, were significantly reduced. However, total elimination of supplemental feeding has not occurred within this area. It is important to note that enforcement of these regulations can be difficult without substantial community interest and involvement (DeNicola et al. 2000)

Repellants

Numerous commercial deer repellants have been developed to prevent unwanted damage to commercial crops, residential gardens, and landscape plants. Refer to DeNicola et al. (2000) or Coey and Mayer (2004) for a comprehensive listing of available commercial repellants. Unfortunately, the success of these substances in preventing deer damage has been limited. The ability to deter deer browsing pressure on any particular plant by applying a repellant is dependant on deer densities and overall forage availability, plant species, and the amount of time passed since repellant application. Most successful attempts to deter deer with repellants typically occur with relatively low deer densities and frequently repeated repellant applications. It is important to note that total avoidance of repellants by deer is rare (DeNicola et al. 2000).

2013 DEER MANAGEMENT OBJECTIVES

The 2013/2014 deer management season proved to be difficult with many obstacles but in the end turned out to be a success. Beginning in May of 2013 HWP initiated their quest to find a wildlife manager. After several interviews and deliberations with city council contracts were signed on the 26th day of September. After several meetings prior to and after contracts were signed the following objectives were outlined:

1). Create a deer management program that would be both economical and productive
2). Provide recommendations for all facets of deer management including population reduction amounts, costs, and methods.
3). Remove a maximum of 40 deer from HWP
4). Conduct deer activities during night hours to decrease public apprehension
4). Maintain a positive relationship between the deer manager and the public
5). Establish and maintain a good working relationship with TPWD
6). Complete, submit, and maintain all TPWD applications, permits, and msc paperwork
7). Organize all activities that pertain to contractual agreements
8). Conduct population surveys if deemed necessary or if previous survey methods proved inadequate
9). Provide frequent updates to the Mayor and Deer Committee about activities being conducted, status reports, and changes
10). Time Permitting, attend Deer Committee meetings
11). Provide a written wildlife management plan
12). Create a presentation paralleling the management plan if deemed necessary

PLAN A: Initially, there were two plans discussed. The first, most supported and widely discussed, was to Trap and Relocate (TTT) deer from HWP to another suitable ranch. This option involved the use of sedatives to immobilize deer at which time they would be loaded onto a trailer and hauled to another permanent home. This option was to be conducted predominately over baited locations with the use of a darting apparatus, a team of handlers, a forward operating base to access and monitor deer health, administer the reversal, and load the deer onto a trailer for transport. It was originally assessed that realistically achievable numbers to dart with these parameters to be between six and eight deer per session. Because of the parameters and the perceivable numbers that could be attained, it was also determined that a suitable release site would have to be within 1.5 hours travel time from HWP. This distance and the amount of transports would be within the budget, time, and parameters of the contract.

PLAN B: The second plan was to Trap Transport and Process (TTP) the deer caught. This plan, although not popular, was discussed as a backup plan in the event that the first plan could not come to fruition. It is important to note that this plan would only be instituted in the event that all other efforts to proceed with TTT were exhausted. In order to accomplish this objective traps, called corral traps, were to be constructed in line with past practices. In previous years using this method traps were constructed with solid panels in a modular design. In order to circumvent the apprehension of the deer to feed in a confined space, new panels would be constructed using netting material. The netting in theory would provide the deer with a sense of ease and perhaps an illusion that they are not being baited into a confined space. As it has been well documented by research as well as conventional wisdom from previous attempts by others at HWP that this method is the least successful method at removing deer from an area.

2013 OBSTACLES

There were many obstacles, problems, and roadblocks that presented themselves in the beginning. The following is a comprehensive list of setbacks that hindered success in some way, shape, or form.

OBSTACLE #1: The first of which was a late start. This automatically set the stage for a compilation of quandaries. Because contracts were not finalized until late September 2013, this left little time to procure necessary aspects of the TTT process. The option for TTT was worked on rigorously from the time prior to contracts being signed until late November. During which time nineteen (19) different ranches were contacted that met the criteria for TTT including a previously used ranch in Ozona. The problems associated with the 18 ranches that met the criteria for a 1.5 hour radius from HWP were 1) most of the ranches (16) were not under MLD level 3 permit, which is not necessary but gives the land owner more control over his/her deer population without intervention from TPWD 2) Because these ranches were not under MLD, TPWD and the deer manager for HWP had to meet at each ranch and conduct habitat surveys and population surveys to assess whether or not releasing deer from HWP would create an overpopulation issue on that particular ranch 3) although, on the 16 non-MLD ranches TPWD did assess that deer could be released, they only allowed 2-5 deer per ranch 4) however, these ranches were voluntarily helping HWP solve the HWP overpopulation problems and because TPWD charges $750.00 per release site, these ranches were not willing to pay the surcharge 5) Because these ranches were not willing to pay the $750.00 the cost would have been left to HWP and because only 2-5 deer were allowed per ranch, it was not economically feasible to carry out such activities. The remaining 2 ranches that were under MLD and could have accepted 15-20 deer each decided to pass on partaking in receiving deer from HWP as it was understood that they would not be able to be selective in which deer were brought to them. The ranch in Ozona, although able to accept up to 50 HWP deer, was decided against due to the prediction of capture rate, time, and distance.

OBSTACLE #2: The second major obstacle was the lack of capture sites in HWP. Only four (4) capture sites were identified as suitable and secured for activities. Of those sites, one site proved by infrared camera that deer activity was poor. Out of the several residences contacted only two (2) residences, Mr. Matt Green and Mr. and Mrs. Jenson, allowed captures to take place on their property. Unfortunately the capture site at Mr. and Mrs. Jenson's was the site found to have little activity. Lack of trap sites greatly reduced the probability of deer being captured at a fixed site because capture activities could only be conducted during certain times. If those times that capture measures were instituted did not coincide with deer movement patterns then the traps were inactive. However with traps in more locations the odds of having a trap in a location during deer movement would have been greatly increased.

OBSTACLE #3: The third obstacle was the abundant amount of feeding that was occurring during the trapping season. It was determined that since it was too late in the year to institute a feeding ban, that one would not be considered. However, it was mentioned by the deer manager that a memo be posted or sent to residences to voluntarily stop feeding. Unfortunately, after those discussions, it was found that there was no change in feeding rates amongst the residences.

OBSTACLE #4: The fourth obstacle was the lack of support for other methods to capture deer as well as stringent guidelines for approved methods. It was decided that darting would only be conducted in predetermined locations as apposed to being mobile. When discussing methods to trap deer without means of immobilization, it was discussed that only the use of corral traps was to be used. It is also well documented that the inherent problem with the coral trap is that to the deer themselves it is a perceivable enclosure with only one way in and one way out. The apprehension created by this type of trap significantly decreases the probability that sizeable numbers of deer will enter the trap to be caught. Generally with these types of traps deer will enter the trap in small groups while other small groups remain just outside the trap to act as sentinels alerting the rest for danger. Also, because trap site availability was extremely limited, the only available sites that could be used were in areas that were not conducive to deer activity. Coincidentally, making deer diverge from their established paths resulting in apprehension.

OBSTACLE #5: The fifth obstacle was that because mobility was limited to fixed sites, only deer that were coaxed into the area via bait could be captured. Since deer tend to move in groups along travel corridors for safety reasons, getting deer to break apart from the group to enter the trap off the path of their travel routes is generally difficult.

OBSTACLE #6: The sixth obstacle that was encountered was volunteer experience and availability. Volunteer assistance is always a good way to save money while providing others with experiences that do not ordinarily present themselves. However, when dealing with volunteers, they are not always adept in the process or functions of capturing deer and mistakes can be expected. These small scale mistakes usually tend to end up with deer escaping as was the case with this season. Although no deer were injured that escaped captive handling, three (3) deer escaped due to poor timing assessment, incorrectly anticipating deer maneuvers, or not executing on predetermined plans with enough expedience. Also because volunteers have no stake in the game per say, it is somewhat a logistical debacle to schedule capture dates and have enough support to carry out operations. Having a large group of dedicated individuals is always hard to come by.

OBSTACLE #7: A seventh obstacle was the design of the corral traps themselves. Due to budgetary constraints, the netting material purchased was slightly inadequate. While, for the most part proved effective, on three occasions multiple deer either hit the netting simultaneously causing the net to burst, or individual deer repetitively hit the net in the same location weakening the net until it failed. Another issue, which is also two fold, is the fact that because trap sites were limited, some of the trap sites were not conducive to establishing a long enough alley. The short alley way did not create enough of an area to confine deer where they were less likely to gain enough momentum to cause netting failure. The design of the original guillotine style door also proved to be less effective than originally thought. It seemed that the metal on metal noise from the guillotine doors as the were released created much undo excitement in the deer. This could explain some of the reason why the netting was taking the abuse that it did. Lastly, because the panels were created 8' in height, some of the deer mature deer were able to escape the trap by jumping completely over the fence. Although this is not a common occurrence, when the sympathetic nervous system is stimulated in full capacity, it is not unheard of. In all, six (6) deer were lost due to flaws in the trap design or construction materials. Of those six (6), two (2) jumped out of the trap, and four (4) escaped by fatiguing the net to failure.

OBSTACLE #8: The eighth obstacle encountered was the miss judgment of deer calmness and reaction. It was originally assessed that the deer would become excited when caught, but because they had been habituated to human interaction their level of excitement would remain substantially less than that of their wild counterparts. However, this assessment was underestimated. Once captured, the reaction of the deer paralleled that of most deer in the wild. However calm they were out of the trap quickly changed once they realized that they were caught.

OBSTACLE #9: The last obstacle was pet activity around the traps, mainly dogs. Neighboring dogs hampered capture ability on multiple occasions primarily because of their barking. This barking usually was instigated by the activity of individuals either walking along the roads or by designated individuals moving into position to close the trap door. In one instance nine (9) deer were scared from the trap by dogs.

2013 ACCOMPLISHMENTS AND MITIGATION OF PROBLEMS

Overall, and especially compared to the previous years, the 2013/2014 season went well. When discussing the results with other deer specialists as well as citizens, the main census was that not only was it a success but also was significantly more successful than originally anticipated. Although there were many setbacks and some push back because of a slow initial success rate, a total of 33 deer were captured. The following is a detailed outline of the results from each session:

Accomplishments

Trap Session Results

Session	*Date of Activity*	*Males Captured*	*Age of Male*	*Antler Characteristics*	*Females Captured*	*Total Deer Captured*
Session 1	1/13/13	0	NA	NA	NA	0
Session 2	1/20/13	0	NA	NA	NA	0
Session 3	1/29/13	1	1	3	NA	1
Session 4	2/19/14	2	1/2,1/2	bb,bb	5	7
Session 5	2/24/14	3	1,1/2,1/2	4,bb,bb	4	7
Session 6	3/05/14	4	1,2,4,5	2,3,8?,unk	7	11
Session 7	3/11/14	0	NA	NA	NA	0
Session 8	3/17/14	3	1/2,1/2,5	bb,bb,unk	4	7
Total		***13***			***20***	***33***

Legend: bb=button buck, Numerical number indicates antler points, unk=shed antlers, 8?=eight pt with broken beam

Of the thirteen bucks caught, only four (4) were older than 1.5 years. The nine that were 1.5 years or younger were mainly 2013 fawn bucks (button bucks) that did not have hard antler. The other young bucks were 4 points or less. Of the four older bucks that were caught, two had already shed their antlers due to their late capture dates. This was a concern at first because the operating procedure agreed upon was that all good bucks would be sorted out and left at HWP. With bucks shedding antlers there was no way to determine whether or not they met the "keep" criteria. However after deliberations with the deer committee and city council, it was found that precedence for capture would override the desire to keep better bucks and thus capture sessions continued until March 17th. Of the other two older bucks captured, one was a buck with moderate antlers and one was an 8-point. The moderate antler size of the one-buck included 5 points on one beam and 3 points on the other but was broke between the G2 and the end of the beam. It is believed that after reviewing camera indices prior to trapping, this buck was a mainframe 10 point. Although this particular buck was the largest captured, he was still classified with the lower end of the spectrum in comparison to the several other larger bucks found on the camera indices. *Please see Appendix for Photos of all deer captured.*

Looking at the success defined by each trap, by far the most productive trap was Site #2. This site was located at the corner of Fleetwood and El Cerrito. The success of this trap can be attributed to the fact that it was located closest to a heavily traveled corridor for deer. It is also important to note that observations while conducting activities showed this trap to be on the eastern periphery of a travel loop. Deer were observed in a circular movement/feeding pattern that involved the deer starting out at some point along Meadowbrook. They then migrated east and south to El Cerrito at which time they would then head back west down Fleetwood. Later in the night they would then mimic that pattern in reverse. In all, 17 of the 33 deer that were caught, were caught at site #2.

Site #1 originally showed the most promise via game cameras. In fact the first deer caught was caught from Site #1. This location was on El Cerrito south of the park in the creek bottom. Although this site was successful, diminishing returns took its toll as the season wore on. It is unexplained as to why this site was productive early on and substantially slowed down over time. The multitude of possibilities are endless, however overall 9 deer were caught at this site. The majority of which were captured in the first several trap session.

Site #3 was the least productive trap of the season as was seen on camera. This trap was established on the SAWS easement where Voigt dead-ends into Fleetwood. The location of this trap is the primary responsibility for less activity in comparison to the other sites. Located well off a travel corridor and boxed in an alley created less than ideal conditions for coaxing deer in. Like Site #1 but reverse in success timing, Site #3 started with little success. However as the season progressed, the Site ended up successful. In all, 7 deer were caught at this site. *For general photos taken from game cameras at each trap site prior to capture please refer to appendix*

MITIGATION

The continuous reflection on improvement and keeping an open-minded approach allowed for the mitigation of many obstacles that were encountered. This produced a successful outcome to a rather dismal start. Although some obstacles were unavoidable and or unfixable, those that were, were mitigated.

A major factor that changed the success of the operation was altering the capture strategy. This modification was twofold 1) trap monitoring procedure, and 2) manpower needs. The initial game-plan was to station one or two individuals at each trap site to monitor activity and when deer entered the trap radio comms would sort out the logistics to give the go ahead to shut to door. However, after several observations it was found that the stationed individuals (sitting in a vehicle) changed the dynamics of the immediate landscape around the traps. This subtle change seemed to have an impact making deer more cautious and apprehensive. To combat this situation capture sites were to remain unattended during subsequent capture sessions. A main forward operating base was established to stage personnel and equipment. Traps were then monitored by checking each trap (driving by in a vehicle) at intervals of 5-15 minutes depending on surrounding deer activity and tenancy to migrate toward the trap. Once deer were noted in the trap, the capture team would be notified and readied and the door would then be shut. By not having traps continuously monitored it resulted in a decrease in manpower needs. Because manpower issues were challenging this aided in procuring enough resources to complete the tasks at hand. The original org-chart for manpower looked as follows:

Deer Manager (1)
Trap supervisors (3-6)
Sorting Chute (2)
Capture Team (4)

Manpower was further decreased be eliminating nonessential personnel and restructuring strategic tasks. During subsequent sessions an entrance operator confirmed there were deer in the trap and secured the door. At that time the entrance operator called in the capture team (a team of four (4) individuals) to enter the trap and execute the task of immobilizing deer prior to being loaded in the trailer. This strategy proved very effective while reducing manpower needs and visibility to the public. The following org-chart reflects the optimized manpower:

Deer Manager (1)
Capture Team (4)

The effectiveness of fewer personnel greatly enhanced volunteer aptitude. Making a strategic plan for a four man strike team proved to be very efficient. Each person on the team had a predefined description of actions upon execution of the plan. This simplified tasks and left little room for error and job overlap. By eliminating the use of a working chute and diverting to a hands on method, this also aided in reducing manpower needs and expedited the amount of time needed to begin the capture sequence. While the hands on approach had an additive affect pertaining to dangerous situations, it also maintained the standard of care for the deer and kept the ability to sort out male deer that were classified as keepers.

Along with reorganizing manpower and task strategy, trap design was also modified by 1) the door mechanism, and 2) a complete overhaul and redesign of traps them selves. The guillotine style door is a proven system for capture, however because the nature of construction and prevailing budget, the guillotine door did not stand up to expectations. The netting was also used on the guillotine door because of its effectiveness in the use on the panels. However, when the door was shut because the deer could not adequately see the netting material there were issues with deer overcoming the door system and subsequently escaping. To mitigate this problem, the guillotine doors were replaced with solid panel plywood doors. There was apprehension as to the effectiveness of this system because the door was now highly visible. However, the results show that the deer did not mind. Also because the door was now solid, once closed, it acted as a sight barrier and aided in keeping deer excitement to a minimum. This also translated to less abuse on the netted panels. Secondly, as an experiment, at the end of the season one trap was completely redesigned. Instead of a typical corral trap in a tear drop shape; the new design was more synonymous to an alley. The trap was also constructed with two doors and erected along a travel corridor adjacent to one of the previous trap location. This design proved exceptionally effective. So effective in fact that within thirty minutes of completing assembly eight (8) deer entered the trap. Unfortunately those eight deer entered during daylight hours and could not be trapped. Overall the success rate and hours spent per deer captured in the new design was significantly lower.

The pet problems (mainly barking dogs) were resolved quickly and fairly easily as each neighboring residence was contacted and the owners were asked if they could keep their pets inside while activities were conducted. All citizens that were contacted accepted and minded the request. Other than residences walking with their animals, there were no more disturbances from pets.

Lastly, an obstacle that was not encountered this season but will surface in subsequent years is diminishing returns. If trapping by corral trap remains as the only approved method for removal as it was in 2013/2014, then trapping success will depreciate significantly from beginning to end. This phenomena occurs by two means 1) as capture activity escalates around the traps, deer apprehension will increase therefore becoming less likely to frequent the trap, and 2) the more deer that are removed from a trap site, the less deer there are to capture. It may take several weeks for other deer from nearby areas to migrate into territories of others. This will greatly decrease the overall success of operations. Thus it is imperative to have a multifaceted approach by utilizing several methods by which to accomplish the goals.

COST ANALYSIS

The cost to accomplish the objectives outlined for this season are outlined in the following (the following numbers are rounded for clean calculation):

Fix Cost:
=$5,200.00 (Services Rendered)

Variable Cost:
=$5,800.00 (Materials, Supplies, Feed, Equipment, Fees, Permits)

Total Contract Sum:
=$11,000.00

Variable Cost Used:
=$5,300.00

Final Cost Incurred by City:
=$10,500.00

Cost Per Deer:
=$318.00 ($10,500.00/33)

Cost Range for Other Municipalities:
=$250-$600

Cost Average for Other Municipalities:
=$425

HWP Cost Comparison:
=26% Below Value

Hours Spent to End of Trap Season:
=530 hrs

Hours Estimated to Contract End:
=740 hrs

Physical Trapping Hours
=104 hrs

Hours/Deer Caught
=3.15 hrs

Estimated Cost/Hour for Services Rendered:
=$7.02/hr (5200/720)

When comparing costs on a per deer basis for HWP to that of other similar contracts, the cost of $318.00 per deer is well within the noted range for other communities. Although not the least costly per deer, it is important to take into consideration that the following years should show a decrease in the cost per deer. In subsequent years utilizing initial materials, supplies, obtaining permission to use other capture methods, and a complete trapping season should all yield higher numbers of deer and less material cost resulting in a decreased amount per each deer caught.

RECOMMENDATIONS AND PROPOSED OBJECTIVES

2014/2015 recommendations are as follows:

1. Revise Contract to begin fiscal year in July
2. Obtain TPWD Permit Approval for operations by early September
3. Begin Operations in October
4. **Remove 75** deer from HWP
5. Use a multifaceted approach to achieve the removal of 75 deer
6. Continue the pursuit of obtaining suitable release sites for the TTT of deer. A 25 deer goal for TTT is a possibility if previous years dilemmas are rectified.
7. Increase mobility of darting operations for a significant increase in success

   Logistics:
   a) Obtain Permission from various citizens to utilize their frontage access
   b) Dart from parked vehicle when deer are present at each of the various locations
   c) Each deer darted to receive an assigned tracker
   d) Establish a transport team
   e) Establish Staging/monitoring Area
   f) Have Vet or vet tech available for one session
   g)Monitor and record each dart fired and re-accumulated
8. Pursue Mr. Tony Allen located in Ozona and seek to have him absorb the cost of the TTT permit and have him make the drive down to pick up the deer.
9. Continue deer removal via Corral trap and new trap design as discussed previously
10. Send out Bulletin for trap site volunteers (To be Executed by City Council or Deer Committee)
11. Acquire at least one (1) more trap site and preferably two (2) (Skyforest/El Portal Area and Havenhurst/Ventura Area)
12. Set up traps along travel corridors
13. Remove 25 deer via trapping
14. Look into Sharpshooting as a viable option

    Logistics:
    a) Define safe, suitable sites with earthen backstops in which to conduct activities
    b) Shots to be taken by a trained marksmen only
    c) Shots to be taken from an elevated position from a stationary platform
    d) Shots to be taken from a 45-degree angle or less
    e) Shots to be taken from 15 yards (45') or less
    f) Have assigned police officer to monitor all activities
    g) Shots to be directed by and agreed upon by assigned police
    h) Only humane head shots to be taken to sever the brain stem as approved by the American Vet Association
    i) Sufficient backstops to be constructed as secondary precautionary measure to the earthen backstop
15. If sharpshooting is seen as viable, remove 25 deer via this method
16. If sharpshooting is not approved, move the 25 deer goal to TTP as a tentative increase
17. Utilize approved methods in the following order 1) Trapping (TTP), 2) Dart and TTT, 3) Sharpshooting
18. Continue night operations
19. Institute City Wide Feeding Band from September to February and firm enforcement thereof
20. Maintain CWD monitoring (to be done by Deer Committee, not to be included in contract price)
21. Utilize processed deer to help meet CWD monitoring quota

BUDGETARY OUTLINE

2014/2015 Preliminary Budget and Cost analysis (75 deer)

Fixed Cost	
Services Rendered:	$5,500.00
Variable Cost	
TTT Darting	
Dart Supplies and Materials:	$1,800.00
TTT Release Site (2x$750 ea):	$1,400.00
Tattoo Materials:	$ 150.00
TTP Capture	
Pen Material:	$2,350.00
Sharpshooting	
Supplies/Equipment:	$ 250.00
Back Stops:	$ 550.00
Processing Fees (50x$25):	$1,250.00
Miscellaneous Maintenance	
Feed:	$1,800.00
Supplies:	$ 700.00
Feeders/Timers/Batteries:	$ 550.00
Total Cost:	$16,300.00
Cost Per Deer (16,100/75):	$ 217.00

2015/2016 Projected Budget and Cost analysis (50 deer)

Fixed Cost	
Services Rendered:	$5,500.00
Variable Cost	
TTT Darting	
Dart Supplies and Materials:	$1,800.00
TTT Release Site (1x$750 ea):	$ 750.00
Tattoo Materials:	$ 50.00
Sharpshooting	
Supplies/Equipment:	$ 250.00
Back Stops:	$ 250.00
Processing Fees (25x$25):	$ 625.00
Miscellaneous Maintenance	
Feed:	$1,800.00
Supplies:	$ 700.00
Feeders/Timers/Batteries:	$ 250.00
Total Cost:	$11,975.00
Cost Per Deer (11,975/50):	$ 239.50

2016/2017 Projected Budget and Cost analysis Maintenance Phase (30 Deer)

Fixed Cost	
Services Rendered:	$5,500.00
Variable Cost	
TTT Darting	
Dart Supplies and Materials:	$1,800.00
Tattoo Materials:	$ 50.00
Processing Fees (10x$25):	$ 250.00
Miscellaneous Maintenance	
Feed:	$1,000.00
Supplies:	$ 500.00
Feeders/Timers/Batteries:	$ 150.00
Total Cost:	$9,250.00
Cost Per Deer (9,250/30):	$ 308.00

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Citizens

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Mr. and Mrs. Muller
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Volunteers

Dustin Mayfield
Justin Bowden
Jim Scholeman
Evan Scholeman
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Kerstan Thomas
Kevin Wilshire
Raul Urbine
Matt Dunn
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Duane Nye
Derek Boehme
Greg Boehme
Kevin Flowers
Ryan Proudfoot
Troy Douglas
Harold Moore
John Mayfield
Joe Faunce
Kevin Wynn
Chuck Byrge

Equipment Donations

Gerald Leik
O'Connor FFA

City Constituents

Mayor: David Ortega
City Council Members
Deer Committee Members

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Mr. and Mrs. Jenson Site (Later Moved to Mr. Matt Green)

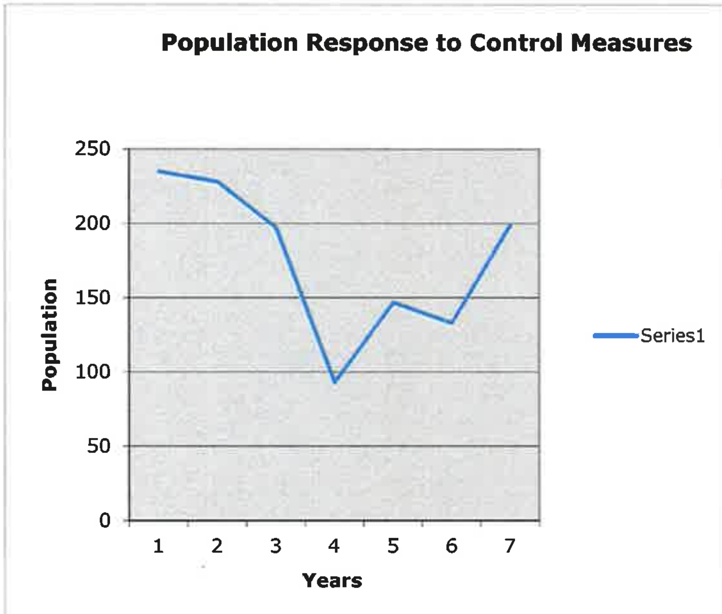
Site#1 El Cerrito at Creek

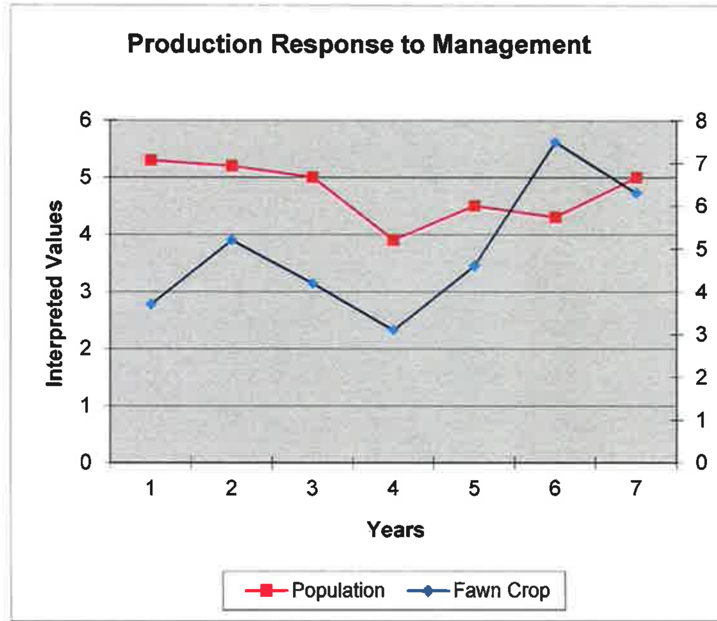
Site #2 Fleetwood/El Cerrito

Site #3 Voigt/Fleetwood

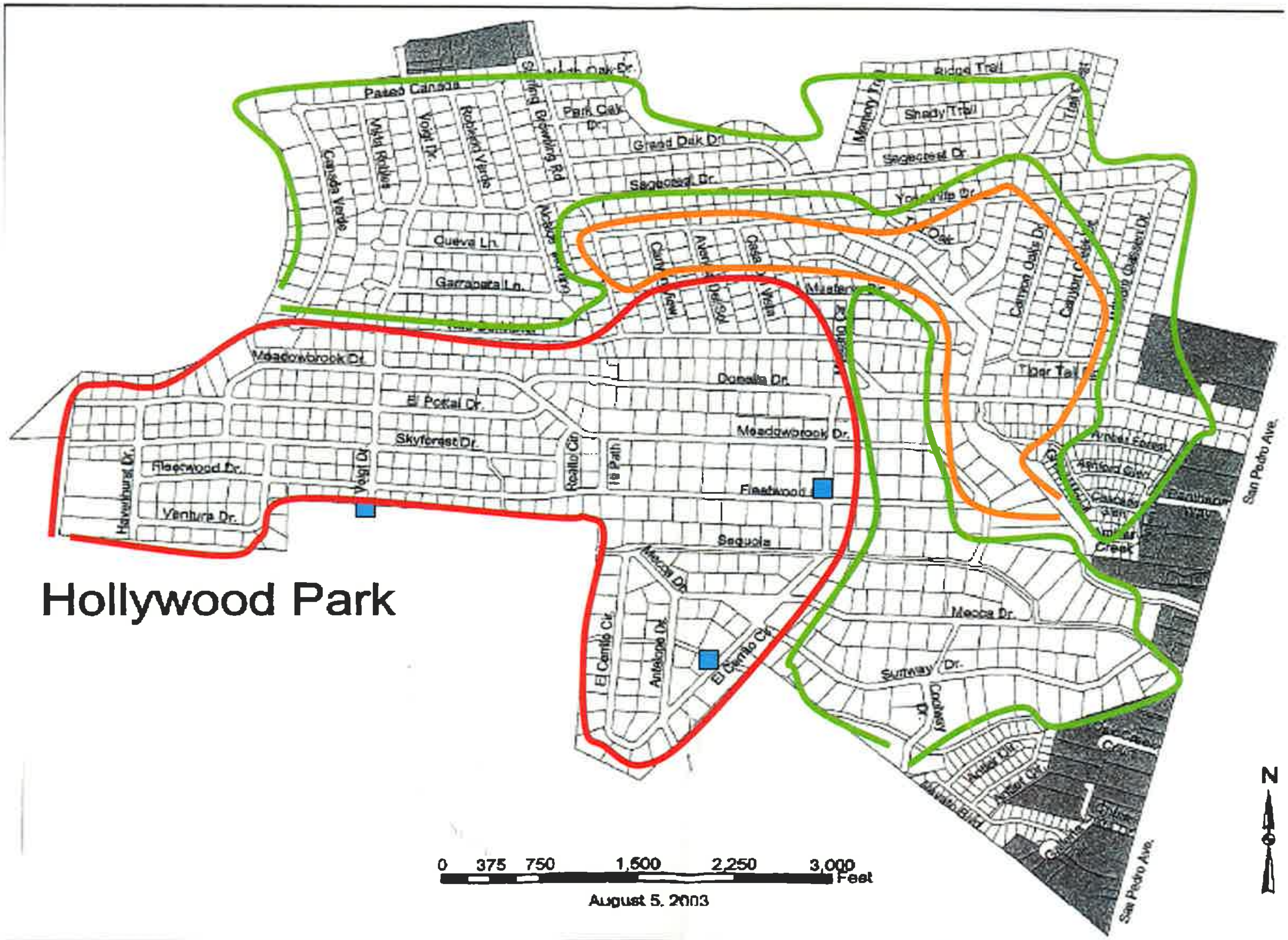
CAPTURED DEER 2013 SEASON

21	156	58	235	7.42857143	0.37179487	Population	Fawn Crop
23	134	71	228	5.82608696	0.52985075	5.3	3.7
16	127	54	197	7.9375	0.42519685	5.2	5.2
17	58	18	93	3.41176471	0.31034483	5	4.2
28	81	38	147	2.89285714	0.4691358	3.9	3.1
26	61	46	133	2.34615385	0.75409836	4.5	4.6
29	104	66	199	3.5862069	0.63461538	4.3	7.5
						5	6.3



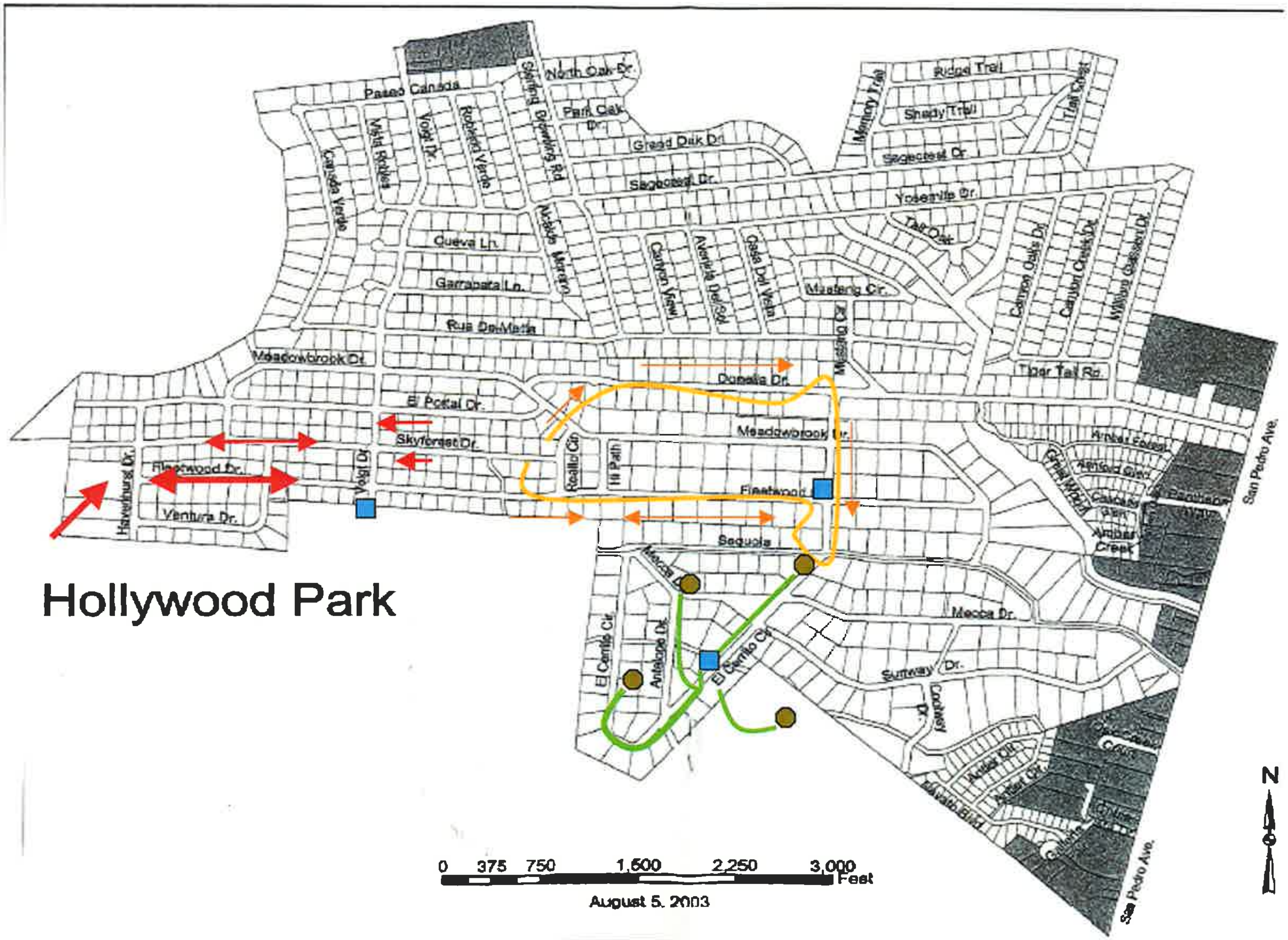


Density Distribution

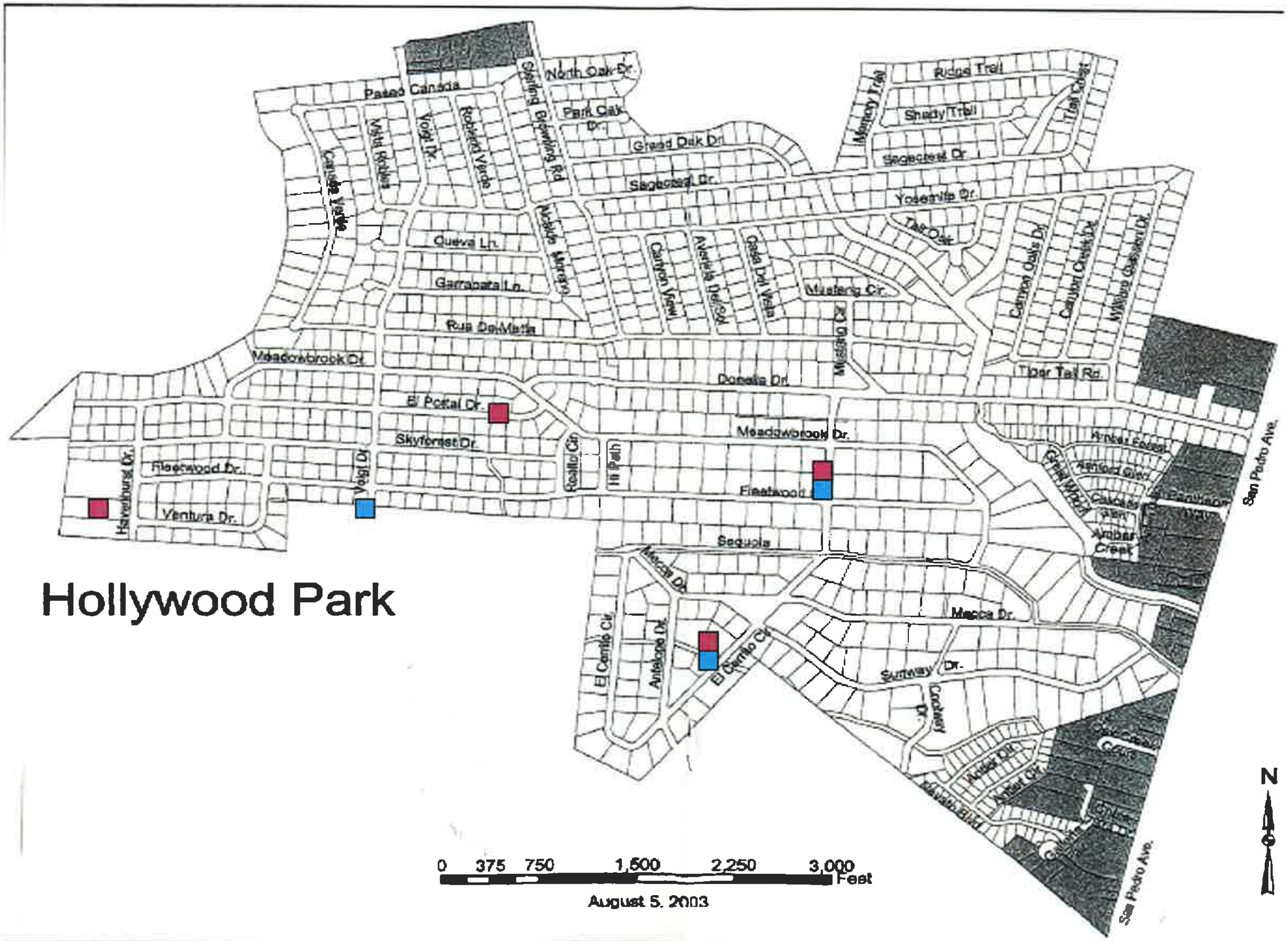


Red= High Density Orange/Yellow= Moderate Density Green=Low Density Blue Square=Trap Site

Deer Movement Patterns Associated with Each Trap



Proposed Trap Sites



Blue Square=Original Trap Site Locations Purple Square=Proposed 2014 Trap Site Locations